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INVISIBLE REATTACHMENT LINE

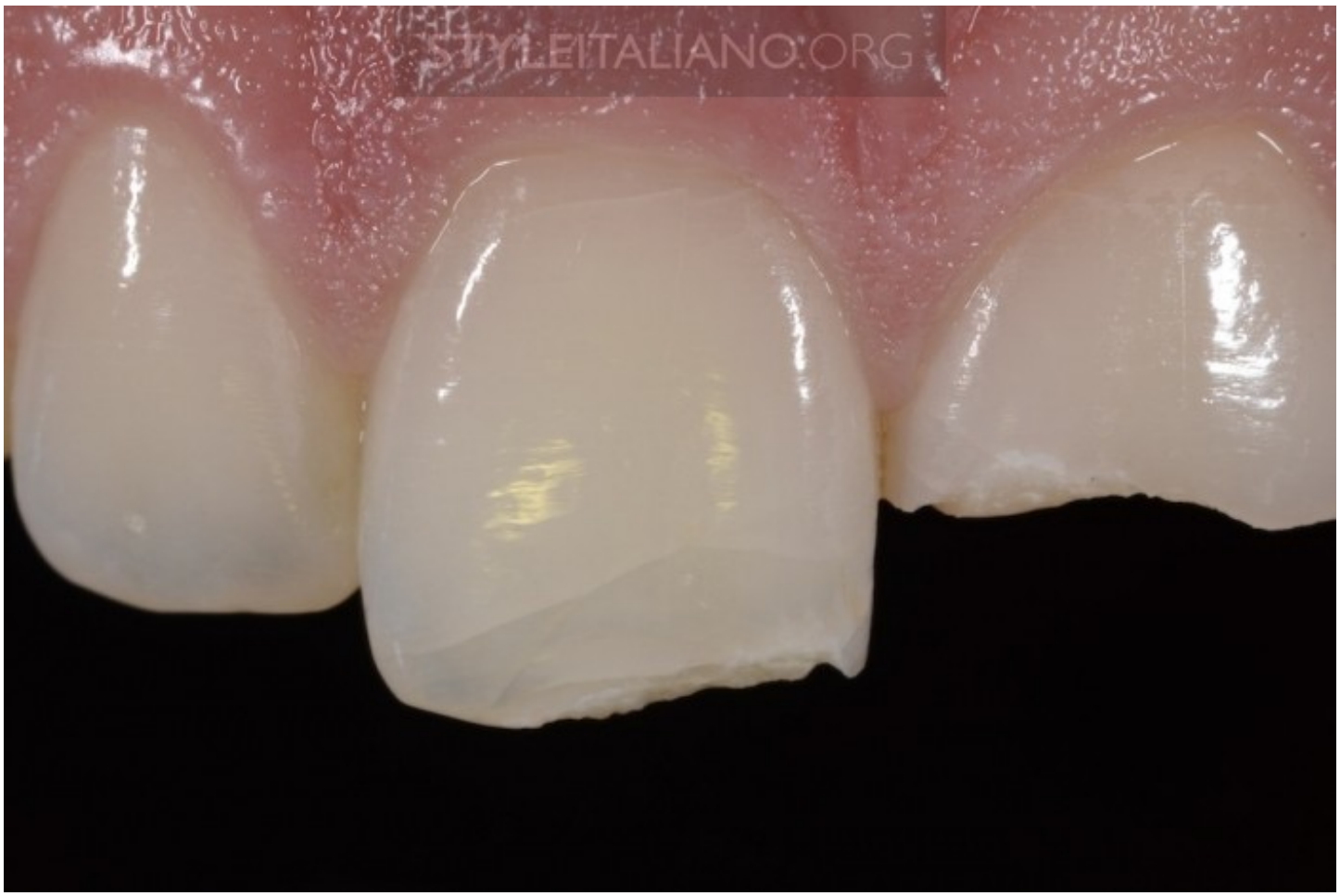
There is a big contradiction in trauma cases in which the patient is the lucky owner of the fractured piece of the tooth. For the dentist, the use of the fractured piece is, contrary to restoring it with composite, a convenient, easy and fast method to exactly restore the tooth in the incisal third, the most vibrant part of the tooth. In the reattachment phase, the exact three-dimensional placement of the coronal fragment is of utmost importance in avoiding corrections afterwards. Therefore, making a bevel along the fracture line in most cases will severely complicate the exact repositioning of the fractured piece; so, reattachment is carried out without beveling. In most of the cases I performed in that manner, the reattachment line is still visible or becomes visible over time. But how to avoid that, and still be certain of an exact three-dimensional reattachment? Making the bevel after reattachment is an easy solution to guarantee invisibility, and, at the same time, accurate repositioning of the coronal fragment. Above all, post reattachment bevel technique offers a significantly higher shear bond strenght, resulting in a higher fracture resistance (2). This clinical case will show how to proceed.

Img. 1 - Initial situation. The patient, an adult male, had fallen on a concrete floor two days before. Both central incisors are slightly tender to touch and concussed, fortunately not displaced. Small injuries from the accident can be seen on the upper lip.

Img. 2 - Both tooth #11 and #21 suffered an uncomplicated crown fracture involving enamel and dentin.

Img. 3 - Sensitivity pulp tests were positve. In some cases, false negative responses to pulp testing can be registered for up to three months.

Img. 4 - The patient was in fortunate possession of the coronal part of tooth #21. So it was decided to use the fragment for reattachment, and to restore #11 with a direct composite restoration.



Img. 5 - In this close-up, a diversity of enamel cracks can be observed. Both on the cervical and also in a diagonal in the incisal 1/3.

Img. 6 - The cracks are accepted to be in the end result. However the transition from the fragment to the tooth on #21 and the transition from composite to the tooth on #11 are anticipated to be invisible in the final outcome.

Img. 7 - Both centrals have the cervical cracks, but also the partial fragment of tooth #21 displays the exact same diagonal crack as the one seen here on tooth #11.

Img. 8 - The fractured tooth #21 displays a pinkish colour that gives away close proximity of the pulp.

Img. 9 - The fragment is kept hydrated in a saline solution. Even when the fragment is highly dehydrated the fragment should be considered usable because rehydration can occur even after reattachment. The fragment was cleaned with chlorhexidine 2% .

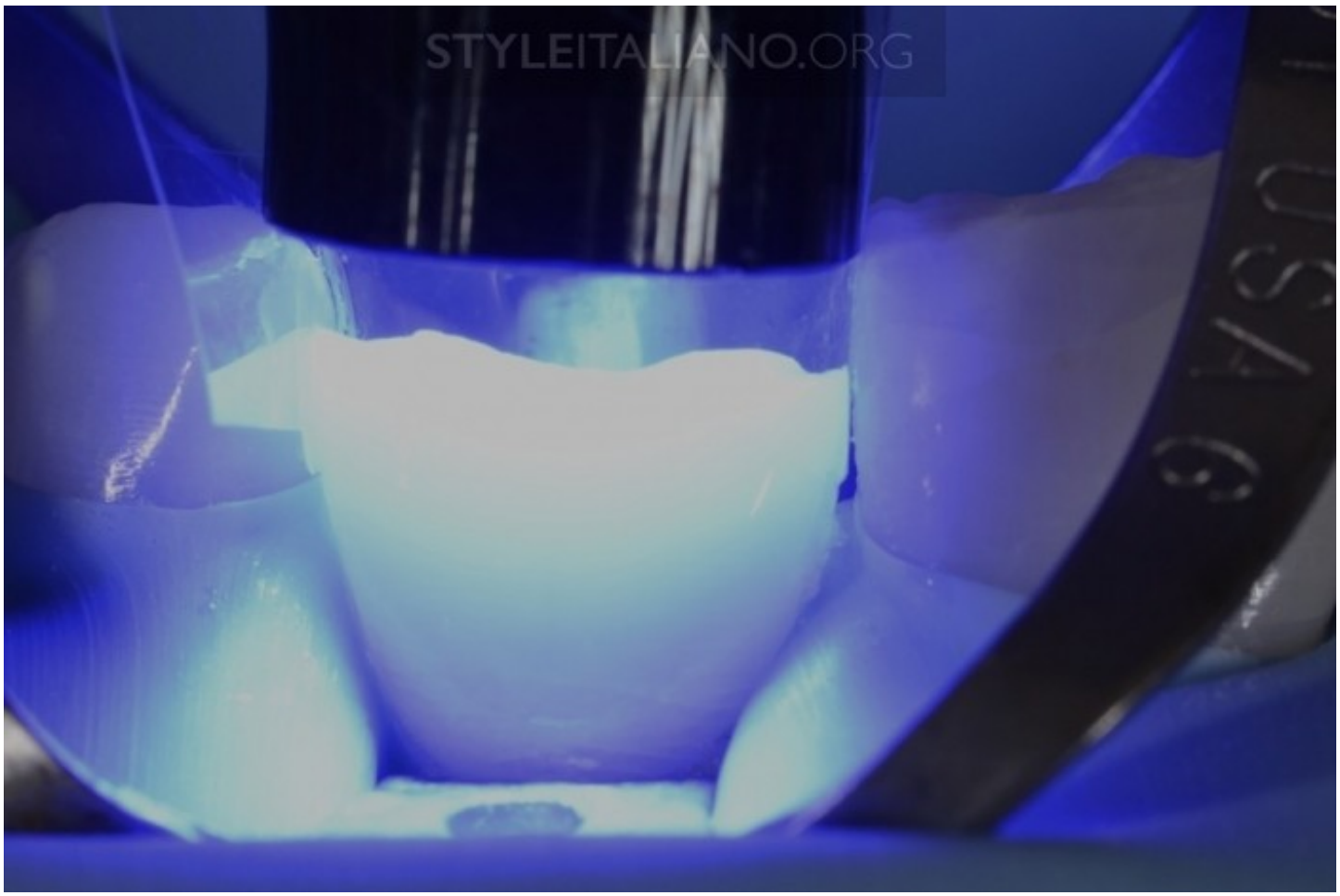
Img. 10 - Because of a fracture line that is more towards the cervical or of the anatomy and position of the anteriors the rubberdam can crawl up to the incisal. To prevent that from happening, floss or a rubberdam clamp can be used. To have an overall view of the outline and anatomy of the tooth facilitates accurate placement of the fragment.

Img. 11 - To protect the neighbouring laterals from sandblasting, strips are placed distally to both centrals.

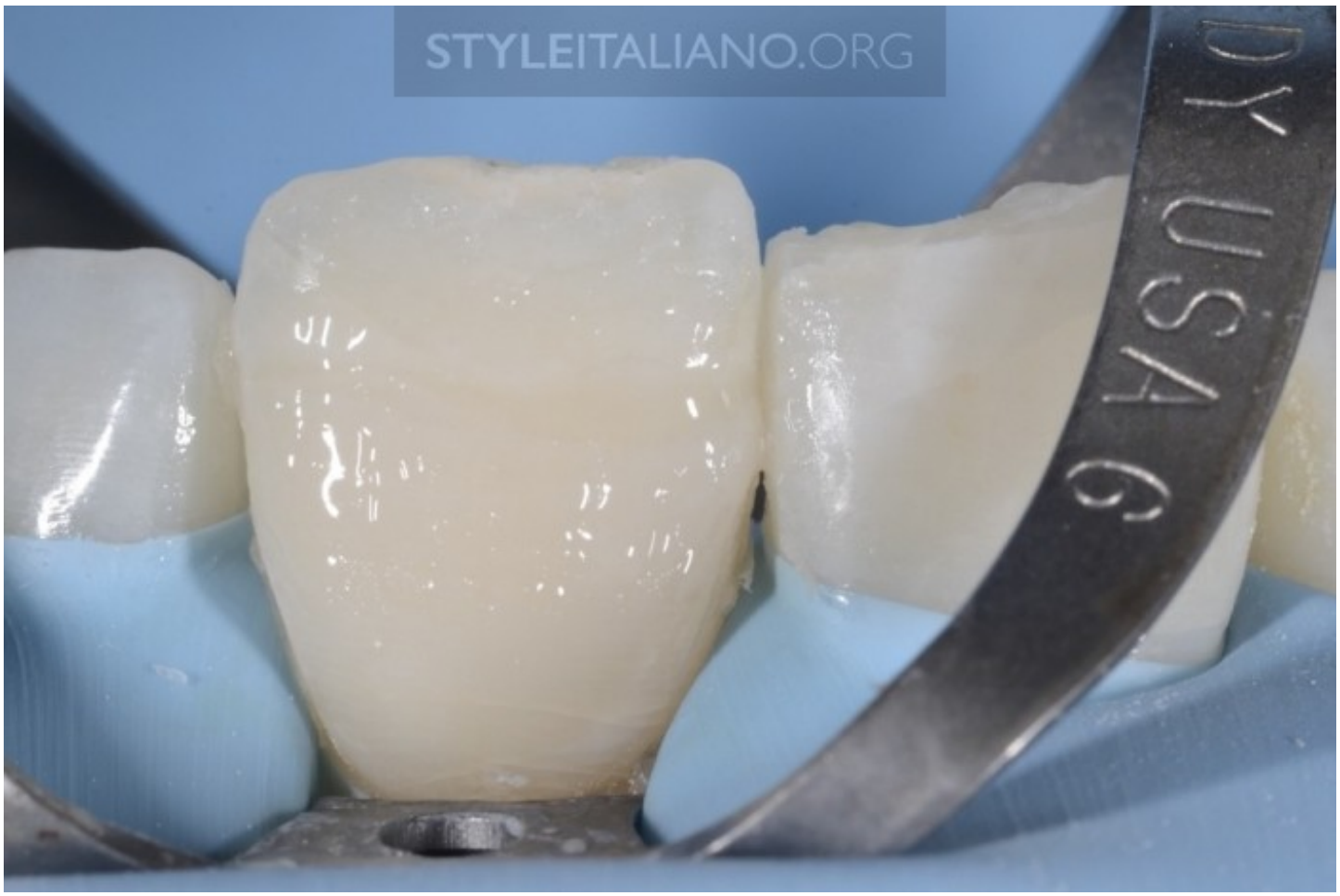
Img. 12 - Before the adhesive procedure, only sandblasting is performed to clean the tooth and to remove the aprismatic enamel layer. Any other adjustment would complicate accurate placement.

Img. 13 - No bevelling at the fracture line. In direct composite cases the bevel of approximately 1,5 mm gives a beautiful natural transition from tooth to composite. That advantage is not there in case of reattachment.

Img. 14 - Selective etching of the enamel of the fragment with 37% phosphoric acid. if the fragment is too small, the use of a sticky instrument can be very helpful.

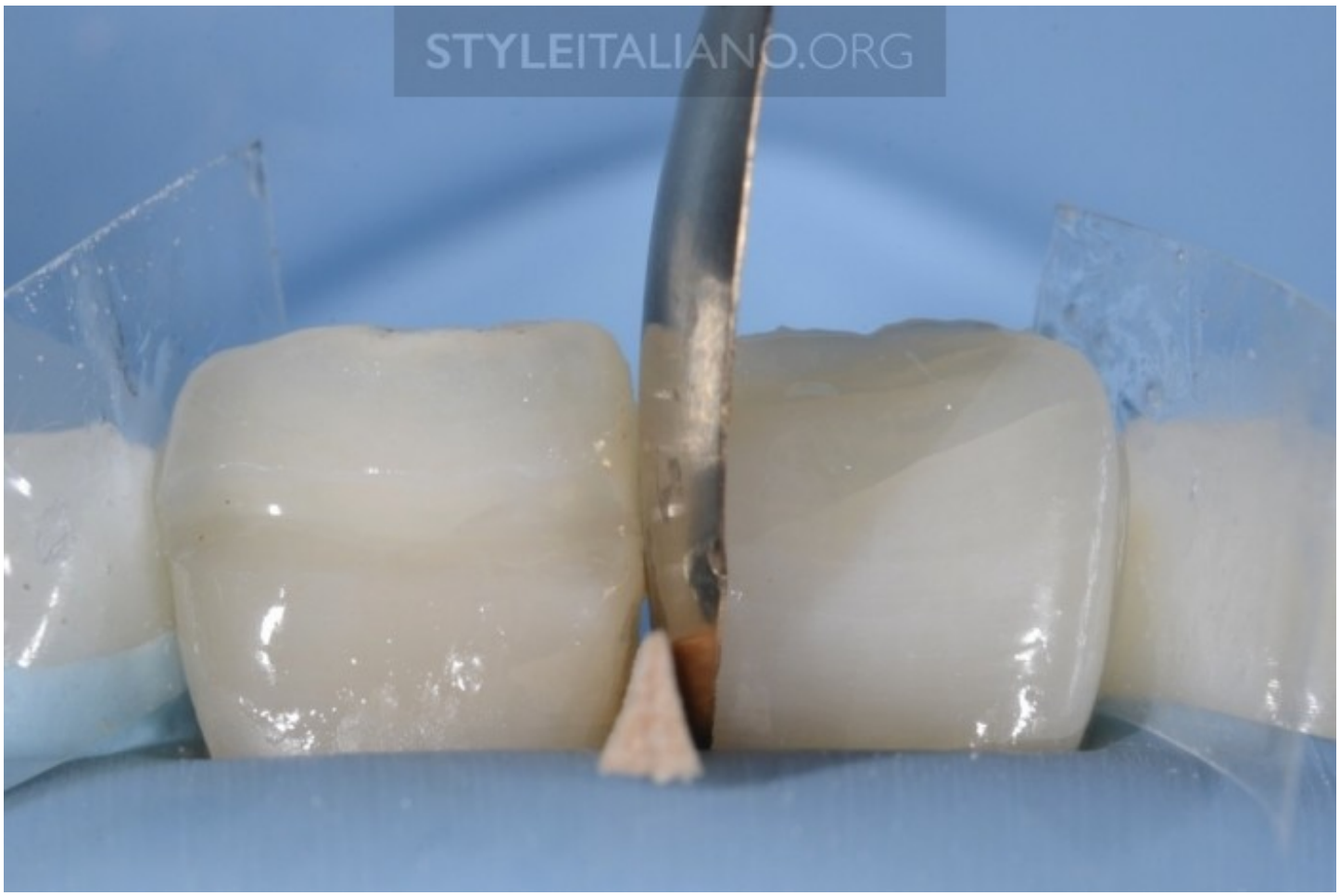


Img. 15 - After etching chlorhexidine 2% was used to inhibit the MMPs. It was decided to lightcure the bonding before placement. That makes the tooth less slippery when placing the fragment. That is an advantage, One can also choose not to lightcure: for example in case of pooling of the adhesive that is unnoticed the cured bonding layer can interfere with stable fitting.



Img. 16 - Placing the fragment. A heated A2 body composite was used. A flowable composite can also be used. That requires less pressure to put the fragment into place, but provides less three-dimensional stability because of its fluidity. A heated composite is a middle ground between stability and easy placement.

Img. 17 - After light curing, a bevel was made on top of the fracture line with a round diamond bur. This gives an equally divided bevel in one movement. A normal bevel was made on the fracture line of tooth #11.



Img. 18 - A matrix and wedge were placed on tooth #11 to etch and bond the two teeth at the same time and to give shape to the mesial.

Img. 19 - Tooth #11 was restored using a layer of body composite and a top layer of enamel composite A2. On the beveled fracture line of tooth #21 first a small amount of flowable composite A2 was applied delicately with the Fissura instrument and then lightcured. On top of that a body enamel A2 was placed. The instrument Applica evened the surface.

Img. 20 - The pencil lines are drawn and according to The Power Of Pencil they are corrected. Note that on the mesial of #21 where the fracture line is beveled and filled with composite, the transitional line is most irregular and needs the most adjusting.

Img. 21 - The final outcome

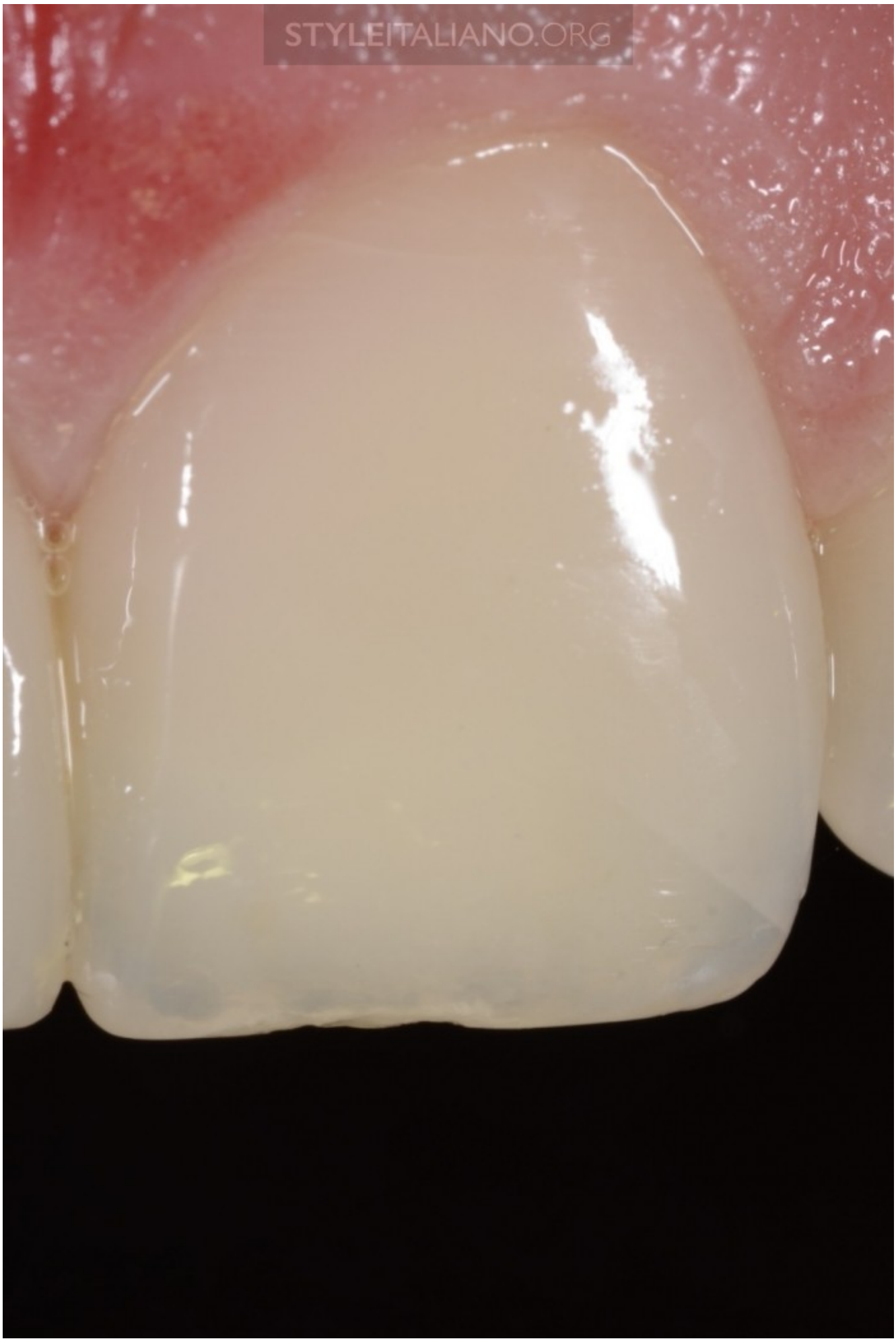
Img. 22 - Accurate placement can be confirmed by the natural facial curve of the tooth.

Img. 23 - The patient's smile restored.

Img. 24 - The injuries have healed nicely and he can smile with confidence again.

Img. 25 - Both diagonal cracks in the incisal third and the horizontal cracks on the cervical are visible on both teeth. The fracture lines are not visible on both incisors. All in accordance with the treatment goal.

Img. 26 - Comparison of the initial situation and final outcome. In these cases pulpal condition will be monitored up to one year before a definite pulpal diagnosis can be made.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Img. 27 - An ultra close-up confirms that only the onset of the diagonal crack is visible. It confirms that there is no fracture line visible anymore because of the bevel procedure after reattachment.

Placing the coronal fragment on the tooth is a delicate manoeuvre. The partial can be slippery because of cement or composite or its small size can make it difficult to handle. To stay away from beveling on both the fragment as the tooth provides three-dimensional stability and accuracy while placing the fragment. A misplaced fragment should be avoided because it can only be corrected by sacrificing sound tissue.
The absence of the bevel increases the risk of visibility of the fracture line immediately after treatment or later on. To make a bevel after reattachment reduces visibility and also increases the fracture resistance of the tooth.

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